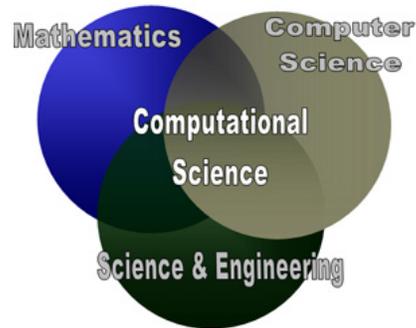
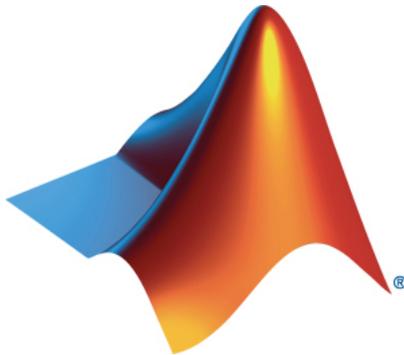


CME 292: Advanced MATLAB for Scientific Computing

Schedule: Spring 2014, Tu-Th 2:15p - 3:30p, Thorton210

Units: 1



Course Description

The goal of this 8-lecture course is to teach advanced MATLAB features, syntaxes, and toolboxes not traditionally found in an introductory course; applications will be drawn from various topics from scientific computing. Lectures will be interactive with breaks for students to write code and experiment with various MATLAB features. Applications will be drawn from numerical linear algebra, optimization, and numerical solutions to Ordinary and Partial Differential Equations.

Students will have the opportunity to design an optional 9th lecture on MATLAB-related topics that were not covered in the first 8 lectures. Students should expect to gain: ♦ exposure to the tools available in the MATLAB software ♦ knowledge of and experience with advanced MATLAB features ♦ independence as a MATLAB user. Successful completion of the course requires satisfactory submission of four homework assignments.

Course Outline

♦ **Advanced graphics** – advanced plotting (vector/surface/slice plots), graphics handles/objects, publication-quality plots, animation ♦ **MATLAB tools** – debugger, profiler ♦ **code optimization** – vectorization, memory management ♦ **advanced data structures** – object-oriented programming ♦ **compiled MATLAB** – MEX interface to C/C++/Fortran, MATLAB Coder to generate stand-alone C/C++ code from MATLAB code ♦ **interfacing with external programs and files** – system calls, file manipulation, communication with spreadsheets ♦ **open-source MATLAB programs** – MATLAB File Exchange ♦ **MATLAB toolboxes** – Optimization, Parallel Computing, Symbolic Math, Partial Differential Equations

Prerequisites

- (required) Basic programming skills in MATLAB (CME 192 or equivalent)
- (recommended) Basic knowledge of numerical analysis and numerical linear algebra

Instructor

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